

## PATENT COOPERATION TREATY

PCT

## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ÉTATS-UNIS D'AMÉRIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 14 December 1999 (14.12.99)	
<b>International application No.</b> PCT/SE99/00678	<b>Applicant's or agent's file reference</b> Case 3152
<b>International filing date (day/month/year)</b> 26 April 1999 (26.04.99)	<b>Priority date (day/month/year)</b> 27 April 1998 (27.04.98)
<b>Applicant</b> STRUCK, Oliver et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:  
02 November 1999 (02.11.99)

☐ in a notice effecting later election filed with the International Bureau on:  
\_\_\_\_\_

2. The election ☒ was  
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer A. Karkachi Telephone No.: (41-22) 338.83.38
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# INTERNATIONAL SEARCH REPORT

International Application No  
//SE 99/00678

**A. CLASSIFICATION OF SUBJECT MATTER**  
IPC 6 D21H17/71 C08F220/56 //D21H17:20,D21H17:68,D21H21:10

According to International Patent Classification (IPC) or to both national classification and IPC

**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
IPC 6 D21H C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X ✓	EP 0 805 234 A (NALCO CHEMICAL CO) 5 November 1997 (1997-11-05) cited in the application page 4, line 27 - line 58 page 7, line 50 - line 54 claims 1,4	1-24
X ✓	EP 0 151 994 A (NALCO CHEMICAL CO) 21 August 1985 (1985-08-21) page 6, line 3 -page 7, line 11	16-24
Y ✓	US 4 250 269 A (BUCKMAN ROBERT H ET AL) 10 February 1981 (1981-02-10) column 1, line 9,10 column 4, line 12 - line 27	1-24
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☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

6 October 1999

Date of mailing of the international search report

04/11/1999

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Naeslund, P

## INTERNATIONAL SEARCH REPORT

International Application No

/SE 99/00678

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y ✓	EP 0 335 575 A (ALLIED COLLOIDS LTD) 4 October 1989 (1989-10-04) page 3, line 49 - line 55 page 4, line 22,23 ---	1-24
X ✓	WO 95 02088 A (ALLIED COLLOIDS LIMITED) 19 January 1995 (1995-01-19) page 7, line 21 - line 34 page 8, line 35 -page 9, line 3 page 12, line 6 - line 26 claims 1,5 ---	1-24
X ✓	US 5 098 520 A (NALCO CHEMICAL CO) 24 March 1992 (1992-03-24) column 5, line 15 - line 25 column 10, line 30 - line 32 column 4, line 15 - line 45 ---	16-24
A ✓	"Pulp and Paper Manufacture", The Joint Textbook Committee of the Paper Industry, Atlanta, 1991, Third Edition, Vol. 7, "Paper Machine Operations", A. Thorp et al, pages 92-94 XP002117664 -----	14,15

## INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

SE 99/00678

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
EP 0805234	A	05-11-1997	AU 1915897 A BR 9701967 A CA 2204050 A NO 972022 A	06-11-1997 15-09-1998 01-11-1997 03-11-1997
EP 0151994	A	21-08-1985	AT 66028 T AU 577735 B AU 3800485 A BR 8500339 A CS 8500583 A DE 3583688 A DK 34085 A ES 539847 A FI 850296 A,B, GR 850215 A JP 60246893 A MX 166763 B NZ 210958 A CA 1249388 A US 4657946 A	15-08-1991 29-09-1988 01-08-1985 03-09-1985 16-09-1988 12-09-1991 28-07-1985 01-09-1986 28-07-1985 17-05-1985 06-12-1985 02-02-1993 30-08-1988 24-01-1989 14-04-1987
US 4250269	A	10-02-1981	AR 223041 A AT 376256 B AT 321880 A AU 534541 B AU 5914780 A BE 884478 A BR 8005003 A CA 1150872 A DE 3027126 A ES 495974 A FI 802458 A,B, FR 2470146 A GB 2063892 A,B IN 152695 A IT 1143100 B JP 1514596 C JP 56076451 A JP 63064470 B NL 8002930 A,B, NZ 193787 A PH 16082 A SE 449870 B SE 8005535 A ZA 8003508 A	15-07-1981 25-10-1984 15-03-1984 02-02-1984 04-06-1981 26-01-1981 09-06-1981 26-07-1983 27-05-1981 01-10-1981 27-05-1981 29-05-1981 10-06-1981 17-03-1984 22-10-1986 24-08-1989 24-06-1981 12-12-1988 16-06-1981 16-03-1982 20-06-1983 25-05-1987 27-05-1981 27-01-1982
EP 0335575	A	04-10-1989	AT 86693 T AU 3174989 A CA 1322435 A DE 68905208 T ES 2053980 T FI 891465 A,B, JP 2006683 A JP 5029719 B JP 5239800 A KR 9602733 B NO 174724 B US 4913775 A	15-03-1993 28-09-1989 28-09-1993 07-10-1993 01-08-1994 29-09-1989 10-01-1990 06-05-1993 17-09-1993 26-02-1996 14-03-1994 03-04-1990

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

SE 99/00678

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9502088	A	19-01-1995	AT 165407 T AU 696483 B AU 7079194 A BR 9407000 A CA 2166696 A DE 69409808 D DE 69409808 T EP 0707673 A ES 2115238 T FI 960068 A JP 8512364 T NO 960058 A NZ 268058 A US 5514249 A	15-05-1998 10-09-1998 06-02-1995 03-09-1996 19-01-1995 28-05-1998 13-08-1998 24-04-1996 16-06-1998 05-01-1996 24-12-1996 05-01-1996 24-10-1997 07-05-1996
US 5098520	A	24-03-1992	AT 114178 T AU 656541 B AU 8831991 A DE 69105193 D DE 69105193 T DK 497030 T EP 0497030 A ES 2067155 T FI 913469 A,B, GR 3014980 T JP 2831165 B JP 4245998 A NO 177394 B US 5185062 A	15-12-1994 09-02-1995 30-07-1992 22-12-1994 18-05-1995 18-04-1995 05-08-1992 16-03-1995 26-07-1992 31-05-1995 02-12-1998 02-09-1992 29-05-1995 09-02-1993

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>Case 3152</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/SE 99/ 00678</b>	International filing date (day/month/year) <b>26/04/1999</b>	(Earliest) Priority Date (day/month/year) <b>27/04/1998</b>
Applicant <b>AKZO NOBEL N.V.</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 4 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The present invention relates to a process for the production of paper from a suspension containing cellulosic fibres, and optional fillers, comprising adding to the suspension drainage and retention aids comprising a cationic organic polymer and anionic microparticulate material, forming and dewatering the suspension on a wire, wherein the cationic organic polymer has a non-aromatic hydrophobic group. The invention further relates to a cationic vinyl addition polymer comprising in polymerized form at least one non-cationic monomer having a non-aromatic hydrophobic group and at least one cationic monomer.

REPLACED BY  
ART 34 AMDT

# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 3152	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/SE99/00678	International filing date (day/month/year) 26/04/1999	Priority date (day/month/year) 27/04/1998
International Patent Classification (IPC) or national classification and IPC D21H17/71		
Applicant AKZO NOBEL N.V.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.



2. This REPORT consists of a total of 6 sheets, including this cover sheet.

- ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of **6** sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☒ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand 02/11/1999	Date of completion of this report 22.08.00
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Naeslund, P Telephone No. +49 89 2399 8614 



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/SE99/00678

**I. Basis of the report**

1. This report has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.*):

**Description, pages:**

1-17 as originally filed

**Claims, No.:**

1-25 with telefax of 17/05/2000

2. The amendments have resulted in the cancellation of:

- ☐ the description, pages:  
☐ the claims, Nos.:  
☐ the drawings, sheets:

3. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

4. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-25
	No:	Claims	None
Inventive step (IS)	Yes:	Claims	None
	No:	Claims	1-25
Industrial applicability (IA)	Yes:	Claims	1-25
	No:	Claims	None

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/SE99/00678

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2. Citations and explanations

**see separate sheet**

**VII. Certain defects in the international application**

The following defects in the form or contents of the international application have been noted:

**see separate sheet**

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/SE99/00678

**Re Item V**

**Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. None of the documents cited in the international search report would appear to disclose all features of any of independent process claims 1 or 2, or independent product claim 16. Thus, the provisions of Art. 33(2) PCT would appear fulfilled.
2. The subject-matter of claim 1 would appear to differ in view of closest prior art **EP-A-0 805 234 (D1)** (see in particular page 4, line 27-page 5, line 22; page 7, line 50-line 54; claims 1 and 4) in that none of the monomers disclosed by this document exhibits a non-aromatic hydrophobic group which is an alkyl group containing at least 3 carbon atoms selected from n-propyl, iso-propyl, n-butyl, iso-butyl, t-butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, undecyl and dodecyl.

It must however be considered that a slight modification of the monomers disclosed by **D1** such that the hydrophobic group is extended from 2 to **at least 3** carbon atoms, as suggested by present claim 1, is a minor modification which comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can be readily contemplated in advance. Moreover, any clear effects not foreseeable by one skilled in the art and directly coupled to this distinguishing feature are not discernable from the application.

Consequently, the subject-matter of claim 1 appears to lack an inventive step (Art. 33(3) PCT).

3. Similar arguments apply to independent claims 2 (note in particular hydrophobic group containing less than 3 carbon atoms under (ii)) and 16 (polymers which would not appear to provide any particular effects) (Art. 33(3) PCT).
4. The additional matter recited in dependent claims 3, 4, 6, 11, 17, 18, 24 would in substance appear to be known from document **D1** (Art. 33(3) PCT).
5. As to the rest of the dependent claims, they would not appear to involve any

inventive step over **D1**, in view of the teaching known from the remaining documents of the international search report (see specific passages cited therein), where appropriate supplemented with common knowledge of the skilled person in the field.

6. The industrial applicability would appear evident (Art. 33(4) PCT).

**Re Item VII**

**Certain defects in the international application**

1. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the background art of all of the relevant documents cited in the search report are not mentioned in the description nor are all of these documents mentioned therein.
2. Independent claim 16 should be drafted in the two-part form where the characterizing portion is preceded by the words "characterized in that".

**Re Item VIII**

**Certain observations**

Although claims 1 and 2 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter and to differ from each other only with regard to the definition of the subject-matter for which protection is sought and/or in respect of the terminology used for the features of that subject-matter. The aforementioned claims therefore lack conciseness. Moreover, lack of clarity of the claims as a whole arises, since the plurality of independent claims makes it difficult, if not impossible, to determine the matter for which protection is sought, and places an undue burden on others seeking to establish the extent of the protection.

Hence, claims 1 and 2 do not meet the requirements of Article 6 PCT.

On entry of the national/regional phase it might be necessary to raise an objection corresponding to R.13.1 PCT in order to establish in which features the common

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/SE99/00678

inventive concept of the independent claims might reside.

Claims

1. A process for the production of paper from a suspension containing cellulosic fibres, and optional fillers, comprising adding to the suspension drainage and retention aids comprising a cationic organic polymer and anionic microparticulate material, forming  
5 and dewatering the suspension on a wire, characterised in that the cationic organic polymer has a non-aromatic hydrophobic group.

2. A process according to claim 1, characterised in that the cationic organic polymer is a vinyl addition polymer comprising in polymerized form one or more monomers comprising at least one cationic monomer having a non-aromatic hydrophobic  
10 group.

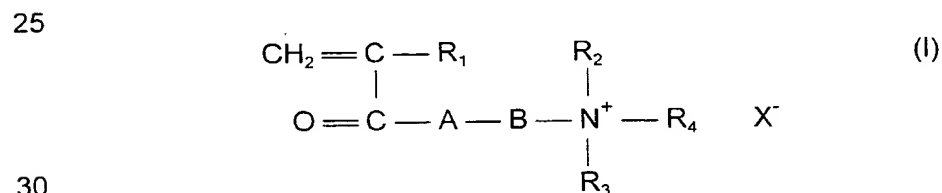
3. A process according to claim 1 or 2, characterised in that the cationic organic polymer is a vinyl addition polymer comprising in polymerized form at least one non-cationic monomer having a non-aromatic hydrophobic group and at least one cationic monomer.

4. A process according to claim 1, 2 or 3, characterised in that the hydrophobic group is attached to a nitrogen or oxygen which, in turn, is attached to the polymer backbone via a chain of atoms.

5. A process according to claim 1, 2, 3 or 4, characterised in that the hydrophobic group is an alkyl group containing from 3 to 12 carbon atoms.

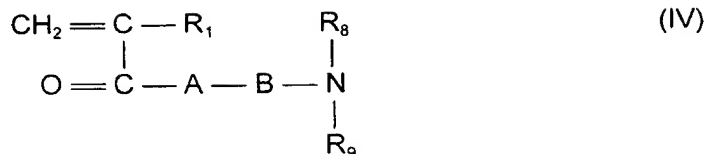
6. A process according to any of the preceding claims, characterised in that the cationic organic polymer is an acrylamide-based polymer.

7. A process according to any of the preceding claims, characterised in that the cationic organic polymer comprises in polymerized form a cationic monomer having a non-aromatic hydrophobic group represented by the general formula (I):



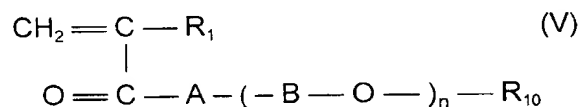
wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ;  $\text{R}_2$  and  $\text{R}_3$  are each an alkyl group having from 1 to 2 carbon atoms; A is O or NH; B is an alkylene group of from 2 to 8 carbon atoms or a hydroxy propylene group;  $\text{R}_4$  is a substituent containing an alkyl group containing from 4 to 8  
35 carbon atoms; and  $\text{X}^-$  is an anionic counterion.

8. A process according to any of the preceding claims, characterised in that the cationic organic polymer comprises in polymerized form a non-ionic monomer having a non-aromatic hydrophobic group represented by the general formula (IV):



wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ; A is O or NH; B is an alkylene group of from 2 to 8 carbon atoms or a hydroxy propylene group or, alternatively, A and B are both nothing whereby there is a single bond between C and N ( $\text{O}=\text{C}-\text{NR}_8\text{R}_9$ );  $\text{R}_8$  and  $\text{R}_9$  are each H or a substituent containing an alkyl group having from 1 to 6 carbon atoms, at least one of  $\text{R}_8$  and  $\text{R}_9$  being a substituent containing an alkyl group having from 2 to 6 carbon atoms.

9. A process according to any of the preceding claims, characterised in that the cationic organic polymer comprises in polymerized form a non-ionic monomer having a non-aromatic hydrophobic group represented by the general formula (V):



wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ; A is O; B is an alkylene group of from 2 to 4 carbon atoms; n is an integer of at least 1;  $\text{R}_{10}$  is alkyl having at least 2 carbon atoms.

10. A process according to any of the preceding claims, characterised in that the cationic organic polymer is a vinyl addition polymer prepared from a monomer mixture comprising from 5 to 25 mole% of monomer having a non-aromatic hydrophobic group, and from 95 to 75 mole% of other copolymerizable monomers.

11. A process according to any of the preceding claims, characterised in that the anionic microparticulate material is selected from silica-based particles and bentonite.

12. A process according to any of the preceding claims, characterised in that the drainage and retention aids further comprises a low molecular weight cationic organic polymer.

13. A process according to any of the preceding claims, characterised in that the suspension that is dewatered on the wire has a conductivity of at least 2.0 mS/cm.

14. A process according to any of the preceding claims, characterised in that the process further comprises dewatering the suspension on a wire to obtain a wet web of paper and white water, recirculating the white water and optionally introducing fresh water to form a suspension containing cellulosic fibres, and optional fillers, to be dewatered,

wherein the amount of fresh water introduced is less than 30 tons per ton of dry paper produced.

15. A process according to any of the preceding claims, characterised in that less than 10 tons of fresh water is introduced into the process per ton of dry paper produced.

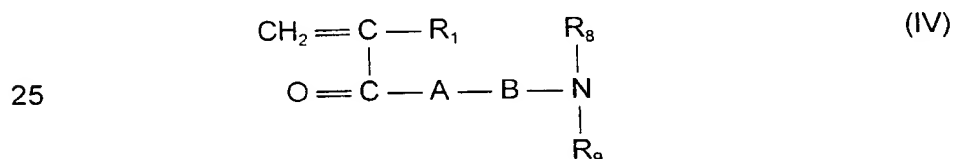
16. A cationic vinyl addition polymer comprising in polymerized form at least one non-cationic monomer having a non-aromatic hydrophobic group and at least one cationic monomer.

17. A cationic vinyl addition polymer according to claim 16, characterised in that the hydrophobic group is attached to a nitrogen or oxygen which, in turn, is attached to the polymer backbone via a chain of atoms.

18. A cationic vinyl addition polymer according to claim 16 or 17, characterised in that the hydrophobic group is an alkyl group containing from 3 to 12 carbon atoms.

19. A cationic vinyl addition polymer according to claim 16, 17 or 18, characterised in that the cationic vinyl addition polymer is an acrylamide-based polymer.

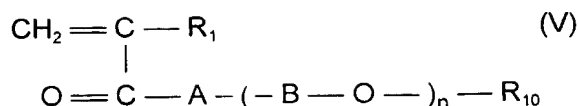
20. A cationic vinyl addition polymer according to claim 16, 17, 18 or 19, characterised in that the cationic vinyl addition polymer comprises in polymerized form a non-ionic monomer having a non-aromatic hydrophobic group represented by the general formula (IV):



wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ; A is O or NH; B is an alkylene group of from 2 to 8 carbon atoms or a hydroxy propylene group or, alternatively, A and B are both nothing whereby there is a single bond between C and N ( $\text{O}=\text{C}-\text{NR}_8\text{R}_9$ );  $\text{R}_8$  and  $\text{R}_9$  are each H or a substituent containing an alkyl group having from 1 to 6 carbon atoms, at least one of  $\text{R}_8$  and  $\text{R}_9$  being a substituent containing an alkyl group having from 2 to 6 carbon atoms.

21. A cationic vinyl addition polymer according to any of claims 16 to 20, characterised in that the cationic vinyl addition polymer comprises in polymerized form a non-ionic monomer having a non-aromatic hydrophobic group represented by the general formula (V):

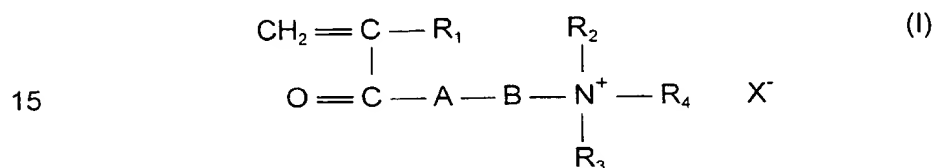




5

wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ; A is O or NH; B is an alkylene group of from 2 to 4 carbon atoms; n is an integer of at least 1;  $\text{R}_{10}$  is alkyl having at least 2 carbon atoms.

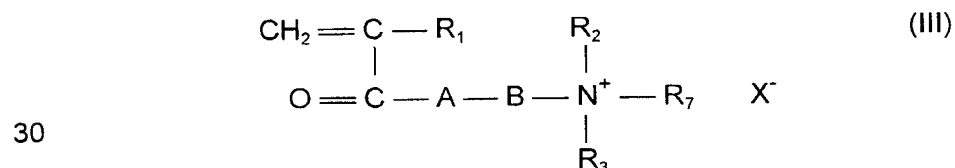
22. A cationic vinyl addition polymer according to any of claims 16 to 21, characterised in that the cationic vinyl addition polymer comprises in polymerized form a cationic monomer represented by the general formula (I):



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wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ;  $\text{R}_2$  and  $\text{R}_3$  are each H or an alkyl group having from 1 to 3 carbon atoms; A is O or NH; B is an alkylene group of from 2 to 4 carbon atoms or a hydroxy propylene group;  $\text{R}_4$  is a non-aromatic hydrocarbon group containing from 4 to 8 carbon atoms; and  $\text{X}^-$  is an anionic counterion.

23. A cationic vinyl addition polymer according to any of claims 16 to 22, characterised in that the cationic vinyl addition polymer comprises in polymerized form a cationic monomer represented by the general formula (III):



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wherein  $\text{R}_1$  is H or  $\text{CH}_3$ ;  $\text{R}_2$  and  $\text{R}_3$  are each H or an alkyl group having from 1 to 3 carbon atoms, suitably 1 to 2 carbon atoms; A is O or NH; B is an alkylene group of from 2 to 8 carbon atoms, suitably 2 to 4 carbon atoms, or a hydroxy propylene group;  $\text{R}_7$  is H, an alkyl group having from 1 to 3 carbon atoms, a benzyl group or a phenylethyl group; and  $\text{X}^-$  is an anionic counterion.

24. A cationic vinyl addition polymer according to any of claims 16 to 23, characterised in that the cationic vinyl addition polymer is prepared from a monomer mixture comprising from 5 to 25 mole% of non-ionic monomer having a non-aromatic hydrophobic group, and from 95 to 75 mole% of other copolymerizable monomers.

40



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>D21H</b>	<b>A2</b>	<b>(11) International Publication Number:</b> <b>WO 99/55962</b> <b>(43) International Publication Date:</b> 4 November 1999 (04.11.99)
<b>(21) International Application Number:</b> PCT/SE99/00678 <b>(22) International Filing Date:</b> 26 April 1999 (26.04.99) <b>(30) Priority Data:</b> 98850067.4 27 April 1998 (27.04.98) EP 60/083,253 27 April 1998 (27.04.98) US <b>(71) Applicant (for all designated States except US):</b> AKZO NOBEL N.V. [NL/NL]; P.O. Box 9300, NL-6800 SB Arnhem (NL). <b>(71) Applicant (for SE only):</b> EKA CHEMICALS AB [SE/SE]; S-445 80 Bohus (SE). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> STRUCK, Oliver [DE/DE]; Oberstrasse 26, D-52349 Düren (DE). HÄLLSTRÖM, Hans [SE/SE]; Knut Stangenbergs väg 162, S-131 47 Nacka (SE). SIKKAR, Rein [SE/SE]; Vesslestigen 2, S-448 34 Floda (SE). <b>(74) Agent:</b> NYANDER, Johan; Eka Chemicals AB, Patent Dept., P.O. Box 11556, S-100 61 Stockholm (SE).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>Without international search report and to be republished upon receipt of that report.</i>
<b>(54) Title:</b> A PROCESS FOR THE PRODUCTION OF PAPER  <b>(57) Abstract</b>  The present invention relates to process for the production of paper from a suspension containing cellulosic fibres, and optional fillers, comprising adding to the suspension drainage and retention aids comprising a cationic organic polymer and anionic microparticulate material, forming and dewatering the suspension on a wire, wherein the cationic organic polymer has a non-aromatic hydrophobic group. The invention further relates to a cationic vinyl addition polymer comprising in polymerized form at least one non-cationic monomer having a non-aromatic hydrophobic group and at least one cationic monomer.		

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(51) International Patent Classification <sup>6</sup> : <b>D21H 17/71, C08F 220/56, // D21H 17:20, 17:68, 21:10</b>		<b>A3</b>	(11) International Publication Number: <b>WO 99/55962</b>
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(21) International Application Number: PCT/SE99/00678 (22) International Filing Date: 26 April 1999 (26.04.99) (30) Priority Data: 98850067.4      27 April 1998 (27.04.98)      EP <del>60/083,253</del> 27 April 1998 (27.04.98)      US (71) Applicant (for all designated States except US): AKZO NOBEL N.V. [NL/NL]; P.O. Box 9300, NL-6800 SB Arnhem (NL). (71) Applicant (for SE only): EKA CHEMICALS AB [SE/SE]; S-445 80 Bohus (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): STRUCK, Oliver [DE/DE]; Oberstrasse 26, D-52349 Düren (DE). HÄLLSTRÖM, Hans [SE/SE]; Knut Stangenbergs väg 162, S-131 47 Nacka (SE). SIKKAR, Rein [SE/SE]; Vesslestigen 2, S-448 34 Floda (SE). (74) Agent: NYANDER, Johan; Eka Chemicals AB, Patent Dept., P.O. Box 11556, S-100 61 Stockholm (SE).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>  (88) Date of publication of the international search report: 16 December 1999 (16.12.99)	
(54) Title: A PROCESS FOR THE PRODUCTION OF PAPER			
(57) Abstract			
<p>The present invention relates to a process for the production of paper from a suspension containing cellulosic fibres, and optional fillers, comprising adding to the suspension drainage and retention aids comprising a cationic organic polymer and anionic microparticulate material, forming and dewatering the suspension on a wire, wherein the cationic organic polymer has a non-aromatic hydrophobic group. The invention further relates to a cationic vinyl addition polymer comprising in polymerized form at least one non-cationic monomer having a non-aromatic hydrophobic group and at least one cationic monomer.</p>			

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/SE 99/00678

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 D21H17/71 C08F220/56 //D21H17:20,D21H17:68,D21H21:10

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 D21H C08F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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